Chapter 19 <u>Create /Transfer Drawings To MicroStation with MXChange</u>

There are five basic types of drawings and displays that typically are generated from MX and sent to MicroStation here at MDOT.

Alignments	alignments.dpw	Contains All MC and GC strings for proposed design in a special format.
Plan	highway.dpw or bridge.dpw	Contains all proposed design strings except those alignment and geometry strings contained in alignments.dpw
Profiles	profile-mc10.dpf proflong-mc10.dpf	A multi-paged profile drawing for a given alignment Long plots(roll20) of the profile for the alignment
Cross Sections	xsmc10.dpf	A multi-paged cross section drawing for each alignment
Geometrics	geometry.dpw	This sheet contains the layout information for intersections, curbing, etc.

Some specific notes about each of these types of drawings, and what procedures should be used to create them are listed below. *It's important to follow these procedures to create these drawings so that all of the elements in the drawings are mapped to the correct MicroStation levels during the translation.*

<u>**Alignments**</u> **–** For each project there should be a display created containing the alignments. In the past, these strings were included in the plan display, but for a variety of reasons, we separate alignments from the other proposed design strings.

The procedure for creating this drawing is as follows:

<u>**Step 1-**</u> Select *Draw = > MDOT Create Alignment Drawing* from the Menu Bar. The following panel will appear:
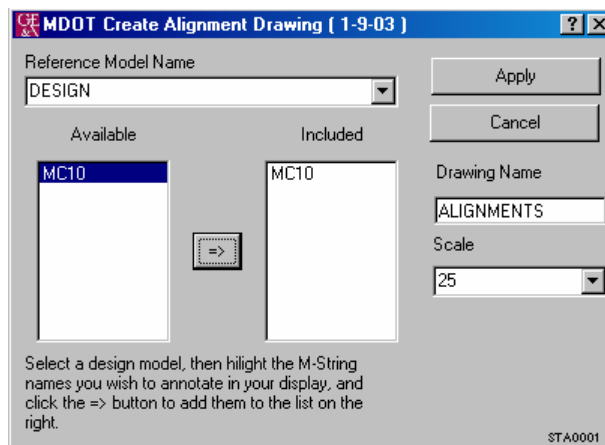
<u>**Step 2**</u> - Select your proposed **Design model** from the top drop-down box, and a list of all **MC strings** will appear in the "Available" column. Highlight the ones that you want to include in your DPW, then click the arrow button to add them to the "Included" column.

Step 3 – Type the proposed alignment drawing name in the drawing name box. For most projects, this simply will be called "alignments", which will result in a drawing called:

alignments.dpw

Step 4 - Select the **scale** of your drawing from the pull down menu.

Step 5 - Click the **APPLY** button to continue.

Your new alignment drawing will be generated "on the fly" so there's no need to create an empty display before using this add-in. The data in the alignments drawing generated from this add-in will look like this:
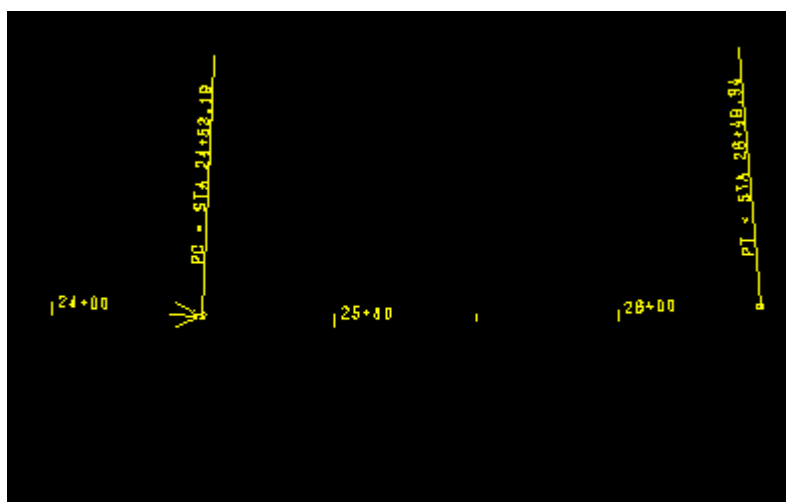
The station annotation will be represented as tick marks and text showing the station. Alignment geometry points will be annotated with flags and text as well.

Step 6 - After the add-in has created this drawing, an additional Add-In called **MDOT DAB.exe** will be launched automatically, and will generate an alignment report for the Master Centerline strings you selected to included in the alignments drawing. This might take awhile if the project is lengthy, but you should see the MDOT DAB Add-In appear with data in the output window.

ATTENTION !!!

The number of decimals places used during this process are important for the proper functioning of the post processing of Alignments.dgn in Microstation.

Us Customary - 2

Metric – 3

Step 7 - click **Save To File**, and save this output as: dab-alignments.prn

This report should be copied up to the Msta directory for your MicroStation group along with the translated drawings.

 Plan Views – For each project, there will typically be only one Plan View display created. Separate plan sheets are laid out and cut in MicroStation, not MX. The standard name of this display is **HIGHWAY.DPW (NOTE: For Bridge MX Users, this display should be named BRIDGE.DPW)**. To create this drawing:

- o Select **File => New Plan Display** from the MX Menu Bar. When prompted for a name, type "HIGHWAY" (or "BRIDGE"), then click **OK**. An empty display will be created called HIGHWAY.DPW (or BRIDGE.DPW).

- o Select **Display => Plan With Style Set** from the Menu Bar. Select your proposed **Design model** name, and make sure that the Style Set box lists one of the following MX Style Sets:

> C:\mdot\imperial_styles\mxroad.pss
> C:\mdot\imperial_styles\Umoss-plan.pss *<-- recommended*

> C:\mdot\mdot_styles\mxroad.pss
> C:\mdot\mdot_styles\ Umoss-plan.pss *<-- recommended*

Note: *If you use* **mxroad.pss***, then you'll need to delete all MC and GC string graphics from the DPW (View => Hide/Delete Graphics) before translating the drawing. If you select the* **umoss plan.pss***, the MC and GC strings are not displayed.*

Click **OK**, and your proposed design will be displayed

Profiles **–** Two Profile Drawings are generally created for each roadway alignment. One drawing is a "Paged" drawing, and the other is a "long plot" drawing. *Use the MDOT Create-Draw Profile Add-In to create these drawings*.

The "Paged" Drawing: - This is the profile drawing broken up into sheets. This add-in has been modified to include a "Microstation" option button on the Color Scheme area. By checking this button, the resulting drawing will be created with all of the ENHANCE objects appropriately named for proper translation with MxChange. This paged drawing will be used to create the official Profile Sheets for the plan set. The standard naming convention for these drawings is "PROF-DESIGN" + M-String Label. For a paged profile drawing based on M-String MC10, the drawing would be

PROF-DESIGN-MC10.DPF

The "Long Plot" Drawing: - This drawing is created for the use of Public Hearing plans. Previously this plot was created as 1 long drawing. With the new Us Customary/Metric interface, the drawing can now be Mxchanged as one long plot or a set of long roll plans, preferably at 10 or 20 ft.

One plot":

We've been asked to create this drawing for the MicroStation detailers as a reference drawing, and to provide a profile for the public hearing plans. This should contain the full vertical curve annotation and grade information. To create this drawing, mark the PubHear color scheme. Double click the "Custom" sheet size and enter in a width. Select this choice and process the drawing. The standard naming convention for the drawing is "PROFLONG-DESIGN" + M-String Label.

proflong-DESIGN-MC10.DPF

MDOT Profile Drawing Information (8-25-03)

Type Of Profile Drawing
- ○ Existing Only
- ● Existing And Proposed
- ○ Exist/Prop. w/o Geom

Color Scheme
- ○ Plotting
- ○ Microstation
- ● PubHear

Scale
- Horiz. 25
- Vert. 5

Sheet Overlap
Overlap(ft): 0

☐ Create Long Profile Drawing Also

Sheet Size	Number Of Sheets
PlanSht	30.79
Roll05	15.90
Roll10	7.73
Roll15	5.11
Roll20	3.81
900	.99

Sheet Title Info

Paged Drawing Name
PROFLONG-DESIGN-MC10

User Name

MEPROF2

OR

MDOT Profile Drawing Information (8-25-03)

Type Of Profile Drawing
- ○ Existing Only
- ● Existing And Proposed
- ○ Exist/Prop. w/o Geom

Color Scheme
- ○ Plotting
- ○ Microstation
- ● PubHear

Scale
- Horiz. 25
- Vert. 5

Sheet Overlap
Overlap(ft): 50

☐ Create Long Profile Drawing Also

Sheet Size	Number Of Sheets
PlanSht	80.92
Roll05	40.34
Roll10	19.25
Roll15	12.64
Roll20	9.41
Custom	

Sheet Title Info

Paged Drawing Name
PROFLONG-DESIGN-MC10

User Name

MEPROF2

The "Roll Plans":

These should contain the full vertical curve annotation and grade information. To create these drawings, mark the PubHear color scheme. Provide an appropriate sheet overlap length (50) and select a sheet size (Roll20).
The standard naming convention for these drawings is "PROFLONG-DESIGN" + M-String Label.

proflong-DESIGN-MC10.DPF

Cross Sections *– Cross Section Drawings should be created using the MDOT Draw Cross Sections Add-In.* Specific instructions for using this add-in can be found in Chapter 6 of this manual. Be sure to select the Microstation drawing type in this wizard. The resulting cross section drawings will be created in a special standard format that is configured to allow all of the elements in the drawing to be mapped correctly to MicroStation levels by the MxChange translator.

The standard naming convention for cross section drawings is to name your drawing "XS" + Master Alignment String Label. The cross section drawing generated from MC10 should be named

XSMC10.DPF

Geometry **-** Geometry sheets are used to provide detailed layout information for intersections and curbing. The exact procedure for creating these sheets is covered in the User Note GEO-1. This geometric information should be created and translated through MxChange in the same manner that the Plan View display is. The standard naming convention for this display for both Highway and Bridge group members is

GEOMETRY.DPW.

## Configuring MXChange for Translation

We've now adapted our MicroStation and MxChange configuration to make it easier for MX users to access. This also includes the dual units of Metric and US customary.

> **NOTE:** We have eliminated the need to switch your MicroStation configuration back and forth between the "network configuration" and "original configuration" depending on what activity you are performing. ***You can access MXChange directly from within the MDOT user interface***.

Starting MicroStation

Before starting MicroStation, you should exit out of MX, or at least switch your current MX display/drawing to one that is not going to be translated.

When you start up MicroStation, you are presented the MicroStation Manager panel:
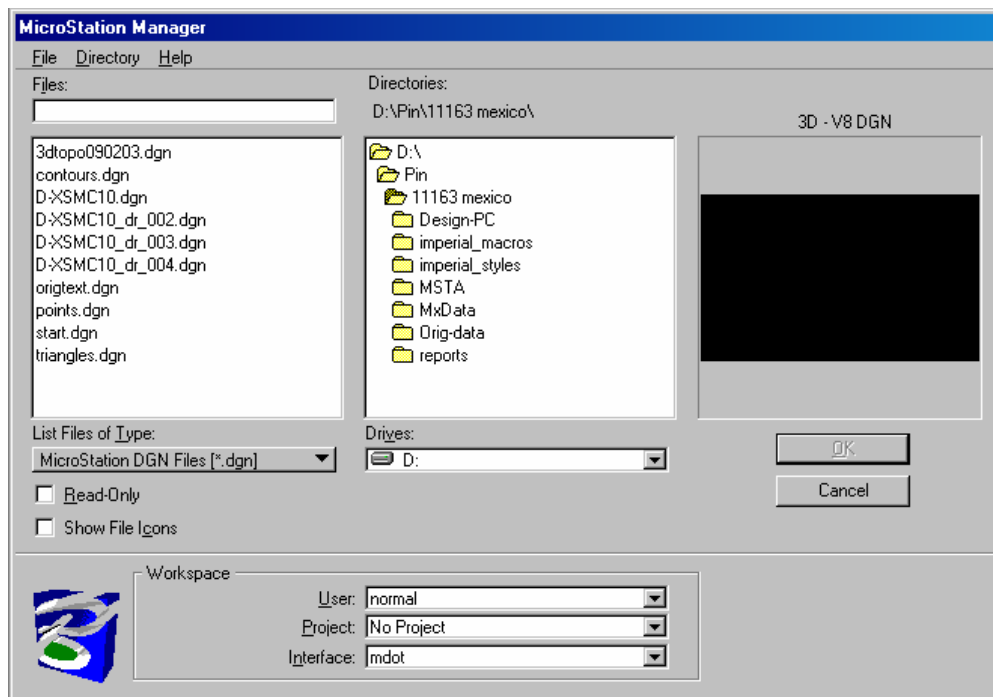
Near the bottom of this panel is the Workspace Frame where you specify the MicroStation Workspace you want to use when you enter MicroStation.

1. The settings in the Workspace area to read as follows:

User	**Normal**
Project	**No Project**
Interface	**mdot**

2. ***Select the project directory*** that contains your MX data in the top part of the panel.

Note: If this is the first time you've used MXChange for this project, you probably won't see any MicroStation drawings (*.dgn) on the file list on the left half of the screen. You'll need to create an empty drawing to continue into MicroStation.

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3. If you have previously created a MicroStation Drawing, *select existing drawing* and proceed. If you need to *"create an empty drawing"*, select **File = > New** from the menu bar. The following panel will appear:
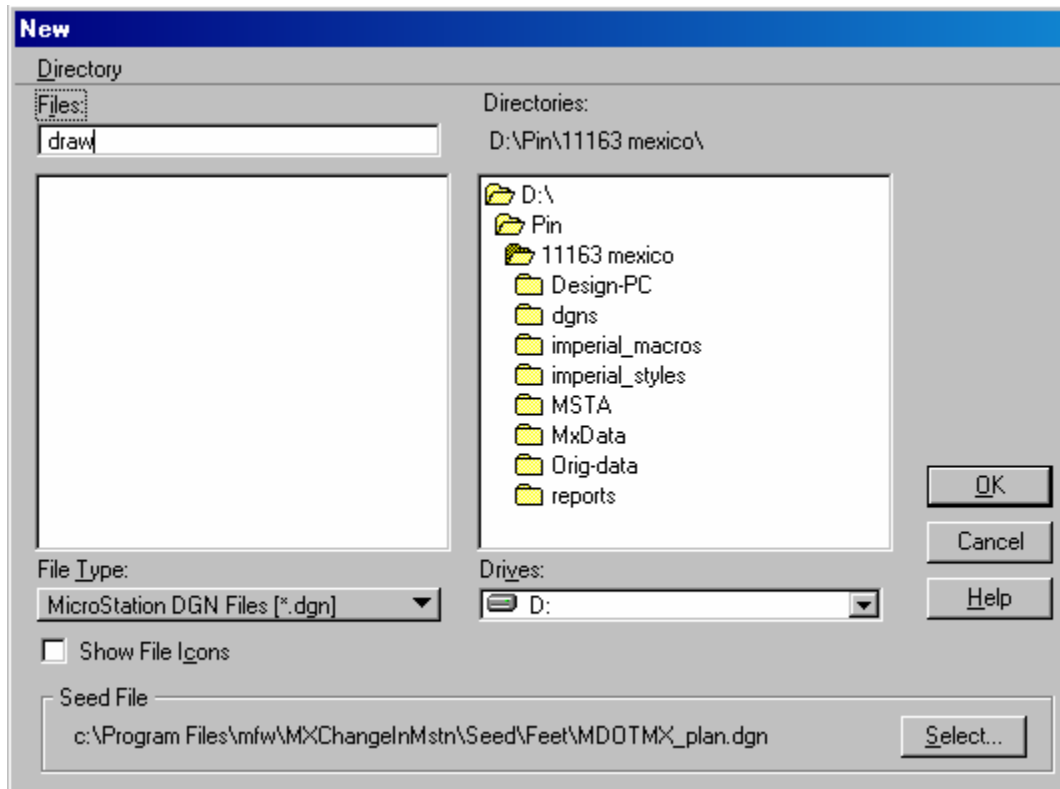

Don't worry about the seed file area at the bottom of this panel. You simply need an active drawing to get past this panel and into MicroStation's main program.

4. *Type a file name* in the text box in the upper left-hand side of the panel.

5. Click *OK* to continue.

6. And *OK* to enter Microstation.

You should now be in an empty MicroStation Drawing called "draw.dgn", or the previously-created drawing you selected.

7. - Open the MXChange Toolbox - The first time you attempt to use MXChange or if you've turned it off in the past, you'll need to open the MXChange toolbox. To open the MXChange Toolbox, select Tools => Tool Boxes from the MicroStation menu bar.
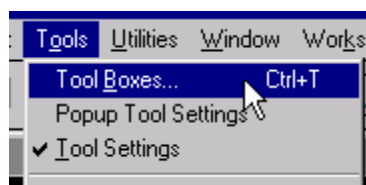
8. Scroll down and *check on the MXChange Tool Box* in the panel that appears, then Click *OK*.
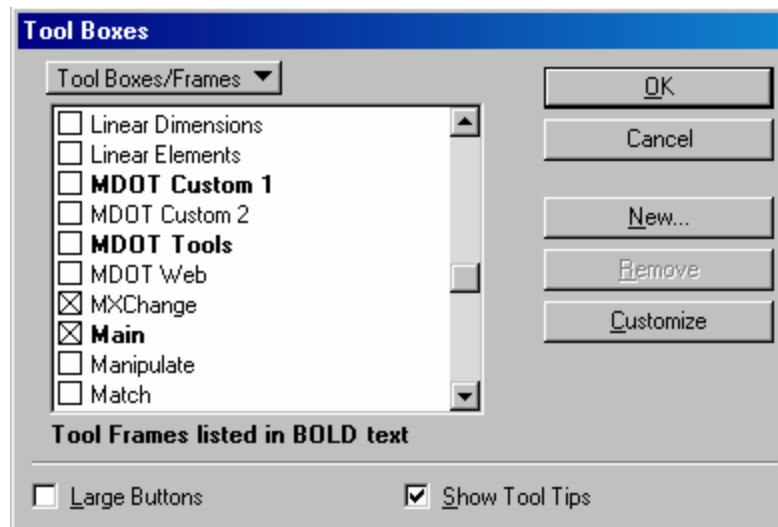
The MXChange tool box will appear. There are three tools on this box. This tool bar is a standard MicroStation toolbar and can be docked to your MicroStation tool area by dragging and dropping it to one of the edges of the screen:

Once you exit MicroStation, it should be visible the next time you enter MicroStation.
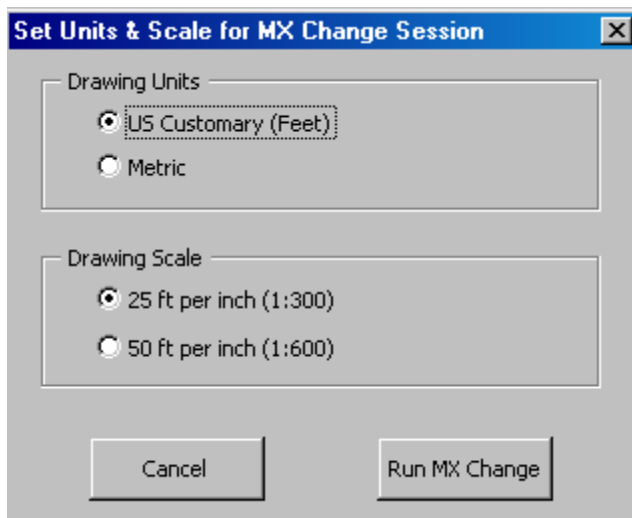
 The first button, **Run MXChange**, will activate a selection panel where the user will need to specify which units and scales the drawings are to be Mxchanged at.

Once the drawing unit and scale are set , click **Run Mx Change** to activate the MxChange panel.

The second tool **"FIX BDR"** is used to post process the microstation dgns that have the border cells, such as XSMC10.dgns and Prof-Design-mc10.dgns. The post processing will re-assign the borders in the correct Microstation levels, color-schemes and line weights.

The third button will **"Exit MXChange"**.

NOTE: Once you are done translating drawings, please remember to *click the Exit MXChange tool* to unload MXChange from your machine. This will make the license for that module available to all the other MX users.


The MxChange Menu panel

If you click on the MXChange menu item, you'll see the following submenu:

Each of these sections is described below:

- **Import MX Drawing** - this is used to begin the drawing or display translation.
- **Load Drawing/View** - this allows you to open an existing MicroStation DGN. We are not currently using this feature..
- **Export DGN to MX** - This allows you to export MicroStation graphical elements into MX. Mdot does not routinely use this feature.
- **Status** - This allows you to find out information about MX elements that are drawn in MicroStation Drawings. (i.e. Model Name, String Name, etc.)
- **Preferences -** this is where all of the customized settings to be used during the drawing translation are accessed. *Details on this section are explained below*.
- **Select By MX Attributes** - This is a MicroStation command that allows you to select graphical elements in the current DGN based on their MX Attributes (i.e. Model, etc.)
- **Help** - Online help on MXChange.

Setting The MXChange Import Preferences
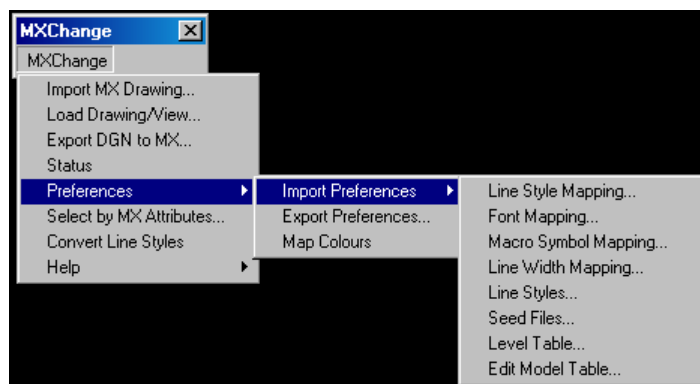
Before any drawing is translated, a number of Import preferences must be set. Some of these preferences only need to be set once per MXChange installation, while the scaling for the line style and macro symbol mapping tables will need to be toggled on or off each time a different type of drawing is translated. The Import Preferences submenu looks like this:

NOTE: Once these preferences have been set for your MX and MicroStation installation, you should not need to change them during normal use of MXChange. The exceptions to this rule are further detailed in this document.

You can browse these preferences if you like to see what they're all about, but some won't be covered in this document. The most important ones are described below.

- **Line Style Mapping** – When translating topography or custom linestyles the **"Ignore MX macro scaling"** must be toggled on with a **check** mark. For Cross section and Profile drawings which use a border cell in the translation, the check mark must be **removed**. For most design use this will be how the preference should be set and left, as the primary translation will be the cross sections and profile drawings.

- **Macro Symbol Mapping** - When translating topography or custom macro symbols the **"Ignore MX macro scaling"** must be toggled on with a **check** mark. For Cross section and Profile drawings which use a border cell in the translation, the check mark must be **removed**. For most design use this will be how the preference should be set and left, as the primary translation will be the cross sections and profile drawings.

- **Seed Files** – The seed files have the same name whether Us Customary or Metric. To verify that the correct path is being used click the Browse button ….

    US Customary - ***C:\Program Files\mfw\MXChangeInMstn\Seed\Feet***
    Metric - ***C:\Program Files\mfw\MXChangeInMstn\Seed\Metric***

    Drawing Template to use for DPWs' – ***MDOTMX_plan.dgn***
    Drawing Template to use for DPFs' – ***MDOTMX_sect.dgn***
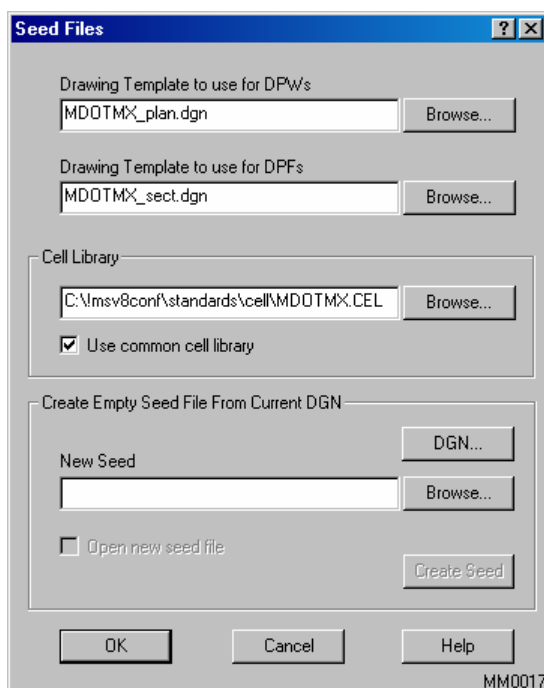
Model Seed File(DPW): This seed file is used to translate displays from MX. In other words, any MX file ending with "DPW" will be translated using this file. Here at MDOT, the drawings HIGHWAY.DPW, BRIDGE.DPW, and GEOMETRY.DPW are translated using this file. The seed file should be:

MDOTMX_plan.dgn

Drawing Seed File(DPF): This seed file is used to translate drawings from MX. That means that any MX file name ending with "DPF" is translated using this seed file. All cross section drawings and profile drawings are translated with this seed file (i.e. XSMC10.DPF, PROFILE-MC10.DPF, etc.) The seed file should be set as:

MDOTMX_sect.dgn

Cell Library – There must be a check mark in the box for **"Use common cell library"**. The library path is…..

    Both Units - ***C:\!msv8conf\standards\cell\MDOTMX.CEL***

> **NOTE:** You shouldn't need to edit these tables if you have followed the standard model and string naming convention, and generated the drawings using the procedures described in the beginning of this chapter, but you might need to create a new one if you are using non-standard drawing files or aren't using the Department's MX model and string naming conventions

Level Table - We have different level structures for each type of drawing as requested by the MicroStation technicians throughout MDOT. MicroStation V8 drawings have unlimited levels, but due to information sharing with Consultants, it is necessary to maintain the original 63 levels which data can be drawn on. This will allow a technician to save a V8 dgn as a V7(J) dgn and transfer it to the consultant.

Users can turn these levels "off" or "on" so that they can control the information displayed in the drawing. This menu selection allows you to open a level table to see what level names and numbers MX elements will be drawn on during the translation process. Table files have the file extension ".TBL" (i.e design.tbl, ground.tbl, etc.)

Model Table – MXChange uses a model table to specify which level table is assigned to each model. Each model has only one level table assigned to it. The most commonly used model names (i.e. GROUND, DESIGN, XS....). are already mapped to the appropriate tables. You might need to add an entry in the model table to tell MXChange which level table should be used if you are using a non-standard model name.

> *The following example is for demonstration purposes only. A model with the starting name of ALIGN* would be included already in the model table as indicated by the listing shown on page 9-14 & 15.*

If you have a design model named ALIGNMC10, you would need to add an entry to the model table to map the *design.tbl* file (used to create proposed design drawings) to this model.

To add a model to the model table:

Select the choice **"Edit Model Table"** from the pull down menu.
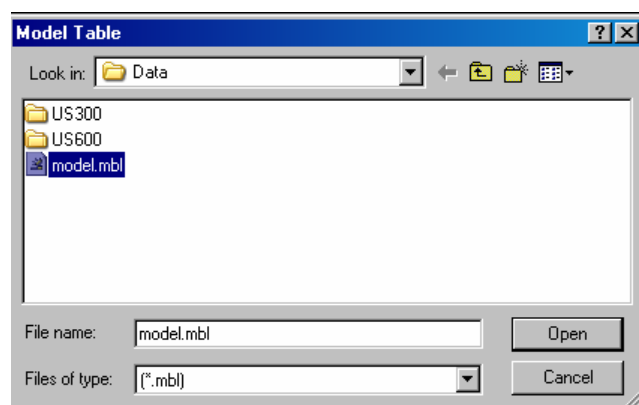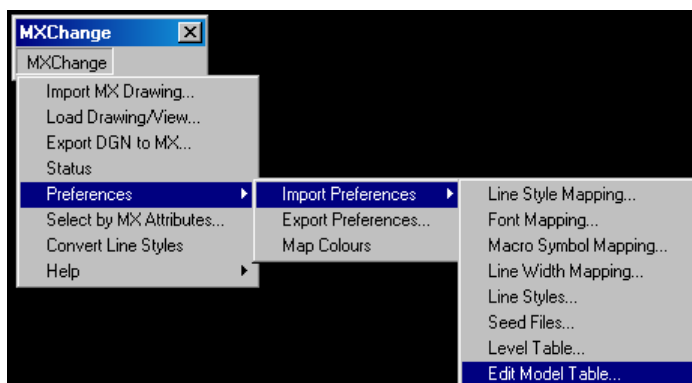
Open the file ***model.mbl*** when prompted by the "file-open" dialog panel.

*Note: This file location is…..**C:\Program Files\mfw\MXChangeInMstn\Data***

The following panel will appear:
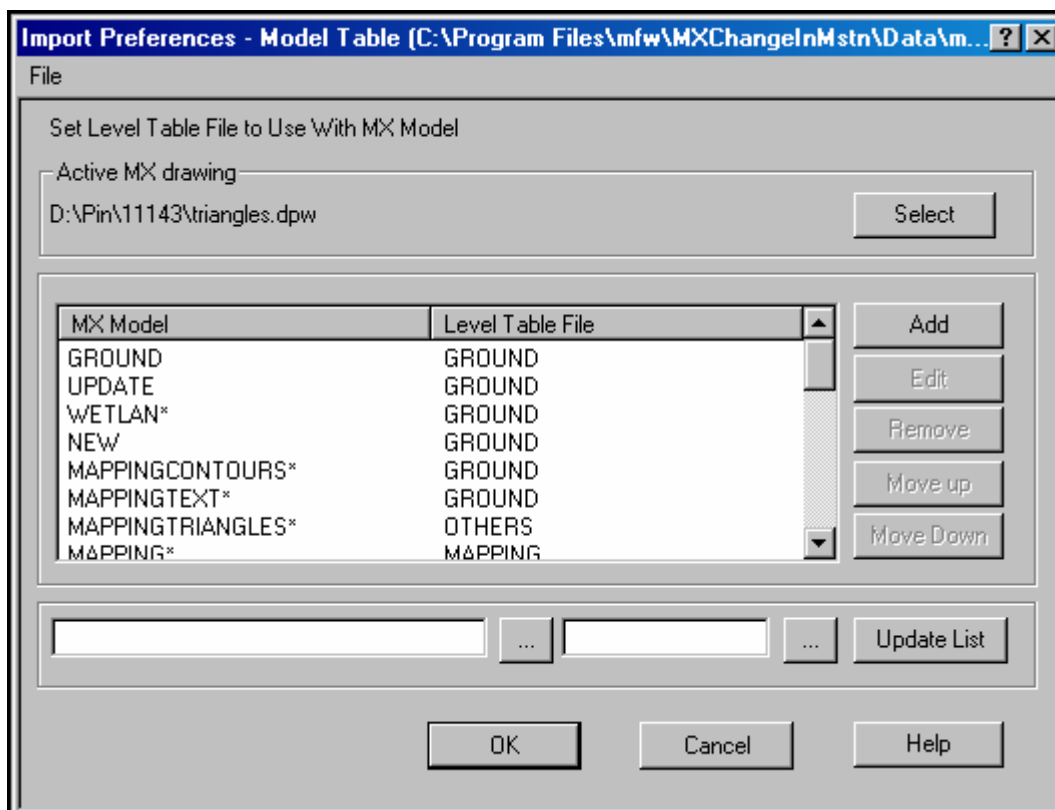
In order to see the models that require mapping to a level table, it is necessary to have a drawing containing those models. The SELECT button will allow you to browse to the correct drawing containing the unique models.
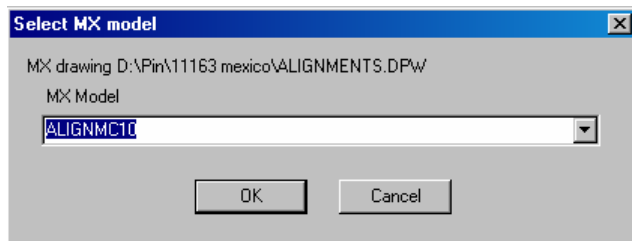
By selecting the ADD button the following panel appears.
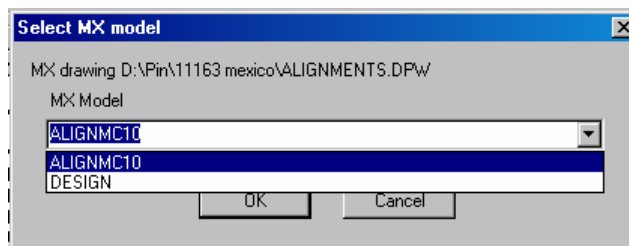
Use the pull down menu to select your model and click OK.

In this sample there is an alignment called "Alignmc10". The full name is displayed in the bottom bar, however it has been reduced and an asterisk is used. The asterisk (*) after the M in ALIGNM* acts as a "wildcard", meaning this table would apply to any model beginning with "ALIGNM". (i.e. ALIGNMC10, ALIGNMA20, etc.)

Select the button associated with the next blank panel. This will give you a browse/select panel for the level table that will be assigned.

The path location for the level tables used for MxChange is …..

C:\Program Files\mfw\MXChangeInMstn\Data

Select the appropriate level table and

OPEN.

The **UPDATE LIST** button will add the new model and level table to the Model.mbl.

It is important to be sure that this line is moved up in the list to location where the general masking will not exclude it. For example it is critical that this line is loca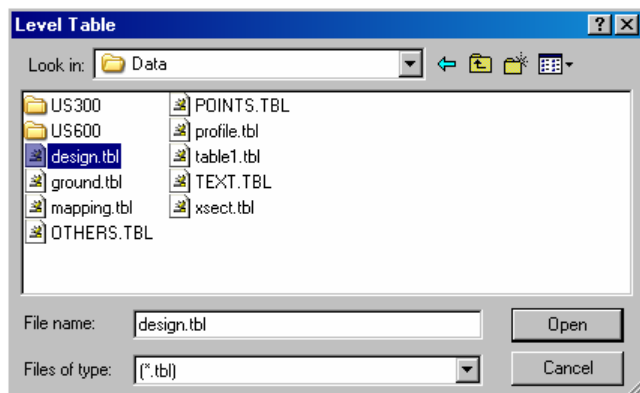ted above the generic mask of ***(model name)** assigned to **Others.tbl**. The **Move Up** and **Move Down** buttons will allow you to place it correctly.

OK will close the panel.

Importing MX Drawings (General Procedure)

In this section, the procedures to be followed for translating an MX display or drawing will be illustrated .

Step 1: **Start up MicroStation** using the **mdot** workspace. You may need to create a new dgn to get into your microstation.   Find the MXChange Toolbar as described earlier in this chapter, and **click the Run MXChange** tool. Remember to choose the appropriate units and scale for your drawings.
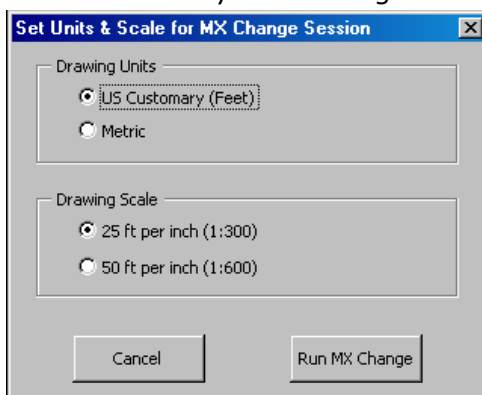
The floating MXChange menu will appear.
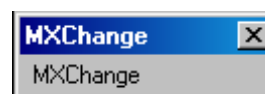
 Step 2: Verify the Import Preferences as described earlier in this chapter.

Step 3: Select your drawing for translation by using the DPF... button to browse to the project folder. The MicroStation Design box will update to the DPF/DPW name with the file extension "DGN". For example, the drawing **Alignments.dpw** will be translated as **Alignments.dgn**. You don't have to accept this default name, however. You can type in another MicroStation Design File name to be created. There should be a check mark in the _Don't Use Reference Files_ check box.
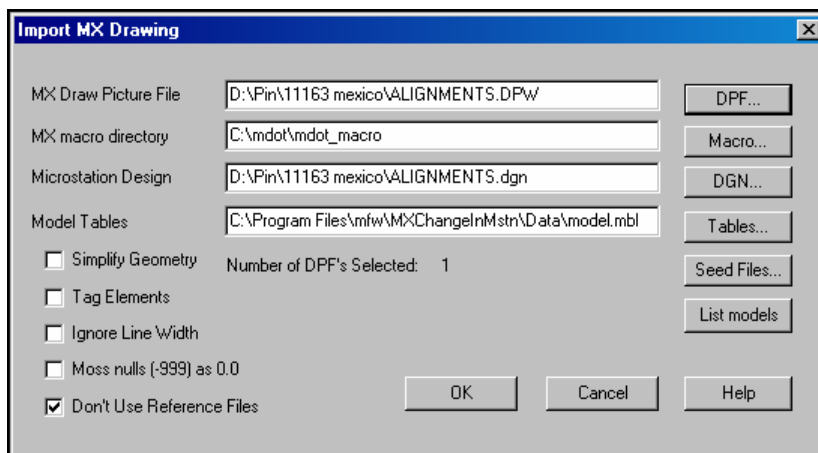
Step 4: **Verify the Model Table** to be used for the translation. This is where MxChange will find what level table to use for each model. (Note: The path shown to the model table in the illustration above is for MicroStation V8.)

All drawings and displays, will now use **model.mbl** It is no longer necessary to use the Profile.mbl for the Profile drawings.

Step 5: **Double check your seed file settings** to make sure that they are designated as follows:
> _Drawing Template to use for DPWs' –_ **MDOTMX_plan.dgn**
> _Drawing Template to use for DPFs' –_ **MDOTMX_sect.dgn**

Step 6: - You **No longer check** the **Simplify Geometry** box.

Step 7: - Place a check in the **Don't Use Reference Files**

Step 8: - Click **OK**

If you are translating Cross sections or multi-paged drawings
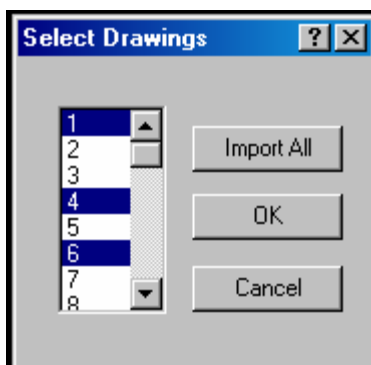
Step 9: **Select which sheets to translate**. You can select a single sheet, range of sheets, or a group of non-consecutive sheets by clicking on the sheet number in the list box on the left and using standard Windows Selection key combinations (Shift or Control). To select all sheets, click the **Import All** button.

Step 10: Click **OK** to begin translation.

Step 11: Run the **Fix Border** macro which is located in the MxChange tool bar.
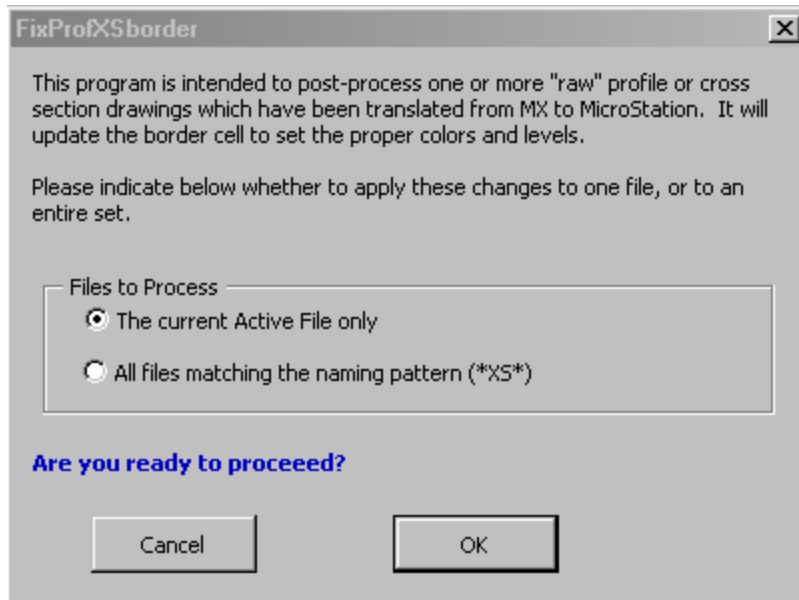
The *FixProfXSborder panel*
Will allow the user to post process one or all necessary drawings.

Step 12: Copy (or Move) the MicroStation DGN's from your local PC directory to the PCPIN directory, or official project file location for your group. For a highway group drawing called Xsmc10.dgn for pin 1234.56, this drawing would be copied to:

\\dot0dta1fscadd1\PCPIN1\pin\1234\56\Highway\Msta\Xsmc10.dgn

NOTE: If you are MicroStation user, you should already have the network location \\dot0dta1fscadd1\pcpin1\ mapped as your "Y" drive.

Step 13: *Unload MXChange* by clicking on the Exit MXChange tool

MXChange Settings Summary Table

Drawing Type	Seed File	Model Table
Plan View	MDOTMX_plan.dgn	MODEL.MBL
Cross Section	MDOTMX_sect.dgn	MODEL.MBL
Profile	MDOTMX_sect.dgn	MODEL.MBL

MODEL TABLES – MDOT Defaults

MODEL.MBL

MODEL MASK	LEVEL TABLE
GROUND	GROUND
UPDATE	GROUND
WETLAN*	GROUND
NEW	GROUND

```
MAPPINGCONTOURS*            GROUND
MAPPINGTEXT*                TEXT
MAPPINGTRIANGLES*           OTHERS
MAPPING*                    MAPPING
MAP*                        MAPPING
TRIMMAPPING                 GROUND
TRIMTEXT                    TEXT
TRIMCONTOURS                GROUND
TRIMTRIANGLES               OTHERS
TRAVERSE                    GROUND
CONTOURS                    GROUND
TRIANGLES                   OTHERS
ALIGN*                      DESIGN
ROW                         DESIGN
POINTS                      POINTS
PROF*                       PROFILE
TEXT*                       TEXT
DESIGN                      DESIGN
GEOM*                       DESIGN
XS*                         XSECT
*                           OTHERS
```

LEVEL TABLES – MDOT Defaults

DESIGN.TBL

```
MASK      LEVEL NAME    SIMP   LEVEL NUMBER


C0*       ROAD            0      17
C1*       ROAD            0      17
C2*       ROAD            0      17
C3*       ROAD            0      17
C4*       ROAD            0      17
C5*       ROAD            0      17
C6*       ROAD            0      17
C7*       ROAD            0      17
C8*       ROAD            0      17
C9*       ROAD            0      17
CB*       CRB_SDWK_RAIL   0      18
CE*       ROAD            0      17
CF*       ROAD            0      17
CH*       ROAD            0      17
CM*       ROAD            0      17
CR*       ROAD            0      17
CS*       ROAD            0      17
CT*       CRB_SDWK_RAIL   0      18
D*        DRIVE_FLD_LOT   0      23
E0*       ROAD            0      17
E1*       ROAD            0      17
E2*       ROAD            0      17
E3*       ROAD            0      17
E4*       ROAD            0      17
E5*       ROAD            0      17
E6*       ROAD            0      17
E7*       ROAD            0      17
E8*       ROAD            0      17
E9*       ROAD            0      17
EB*       CRB_SDWK_RAIL   0      18
EF*       ROAD            0      17
EH*       CRB_SDWK_RAIL   0      18
ER*       ROAD            0      17
ES*       ROAD            0      17
ET*       CRB_SDWK_RAIL   0      18
EV*       ROAD            0      17
EW*       CRB_SDWK_RAIL   0      18
EX*       CRB_SDWK_RAIL   0      18
```

```
GC*     H_V CONTROLS     0      8
I*      CUTFILLCLL       0      15
LC*     GROUND           0      12
MC*     CENTERLINE       1      16
MR*     ROAD             1      17
R*      CUTFILLCLL       0      15
STAT    H_V ANNOTATION   0      9
TB*     CRB_SDWK_RAIL    0      18
TF*     ROAD             0      17
TI*     ROAD             0      17
TJ*     ROAD             0      17
TK*     ROAD             0      17
TL*     ROAD             0      17
TT*     CRB_SDWK_RAIL    0      18
*       UNCLASSED        0      50
```

XSECT.TBL

```
MASK     LEVEL NAME     SIMP    LEVEL NUMBER


/*       FRAME            0      1
101M     MEDIUM           0      6
1MTR     MAJOR            0      7
200M     MINOR            0      5
205M     MAJOR            0      7
4000     H_V CONTROLS     0      8
5000     H_V CONTROLS     0      8
5P2M     MINOR            0      5
6000     H_V CONTROLS     0      8
AXIS     TEXT             0      49
BOXA     H_V CONTROLS     0      8
CELE     H_V ANNOTATION   0      9
CHAI     H_V ANNOTATION   0      9
ELEV     H_V ANNOTATION   0      9
GC*      H_V ANNOTATION   0      9
GRAD     H_V ANNOTATION   0      9
G*       GROUND           0      12
L*       GROUND           0      12
M*       TEMPLATE         0      10
STAT     H_V ANNOTATION   0      9
S*       SUBGRADE         0      14
T*       TEMPLATE         0      10
Z000     H_V ANNOTATION   0      9
Z001     TEXT             0      49
Z002     H_V ANNOTATION   0      9
Z010     MAJOR            0      7
Z011     MAJOR            0      7
Z012     MEDIUM           0      6
Z013     MINOR            0      5
Z014     H_V CONTROLS     0      8
ZFRM     FRAME            0      1
ZZZZ     PLOT BOUNDARY    0      60
*        UNCLASSED        0      50
```

PROFILE.TBL

```
MASK     LEVEL NAME     SIMP   LEVEL NUMBER

101M     MEDIUM           0      6
205M     MAJOR            0      7
4000     H_V CONTROLS     0      8
5000     H_V CONTROLS     0      8
5P2M     MINOR            0      5
```

```
6000    H_V CONTROLS    0    8
AXIS    TEXT            0    49
CELE    H_V ANNOTATION 0    9
CHAI    H_V ANNOTATION 0    9
GRAD    H_V ANNOTATION 0    9
GC*     H_V ANNOTATION 0    9
G*      H_V ANNOTATION 0    9
L*      GROUND          0    12
M*      TEMPLATE        0    10
ZFRM    FRAME           0    1
ZZZZ    PLOT BOUNDARY   0    60
/*      FRAME           0    1
*       UNCLASSED       0    50
```